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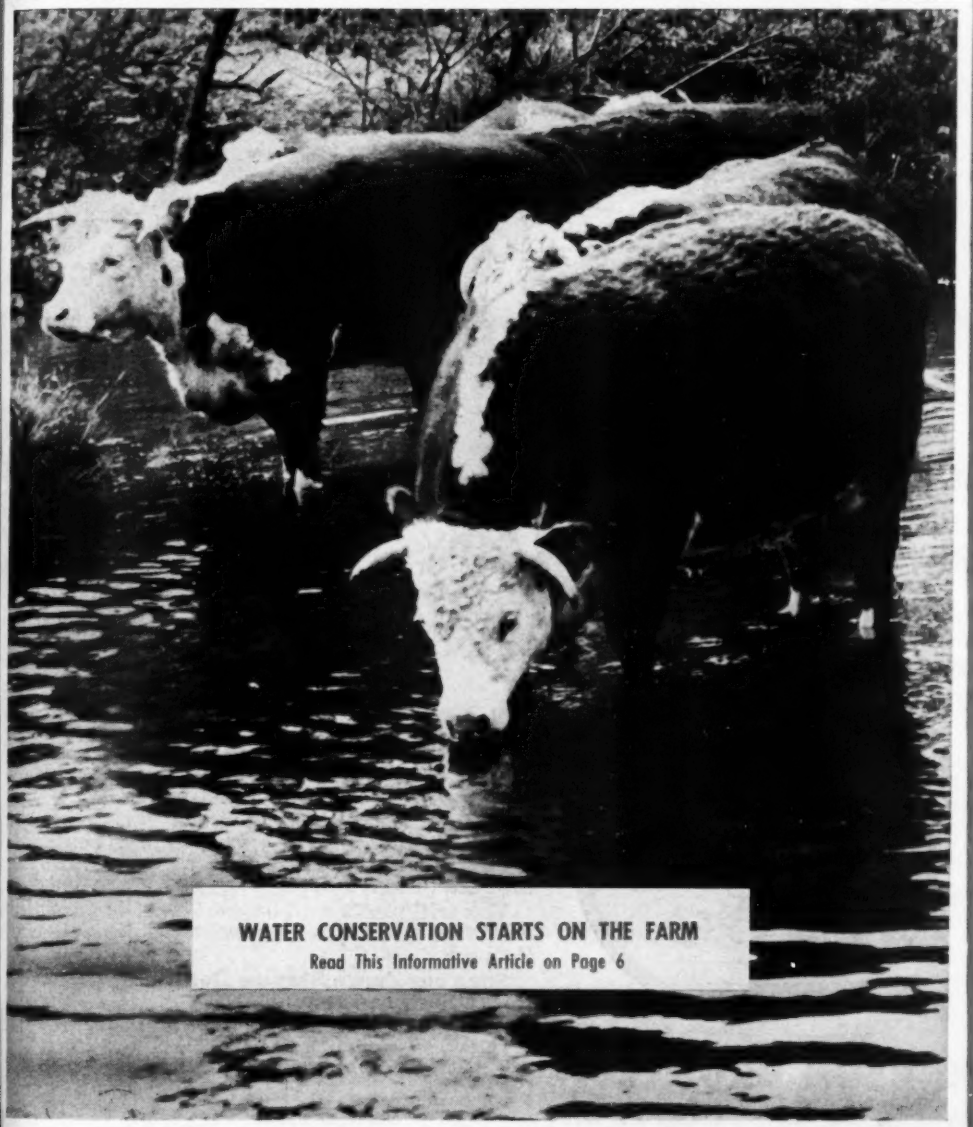
ELECTRICITY ON THE FARM *Magazine*

MAY 1955

Irrigate When Soil Tells You.
Farm Feed Processing Pays . . .
Mow Drying Saves More Leaves.
Pump Designs are Changing . .
Attic Fan "Comfortizes" Home.

28th Year



WATER CONSERVATION STARTS ON THE FARM

Read This Informative Article on Page 6

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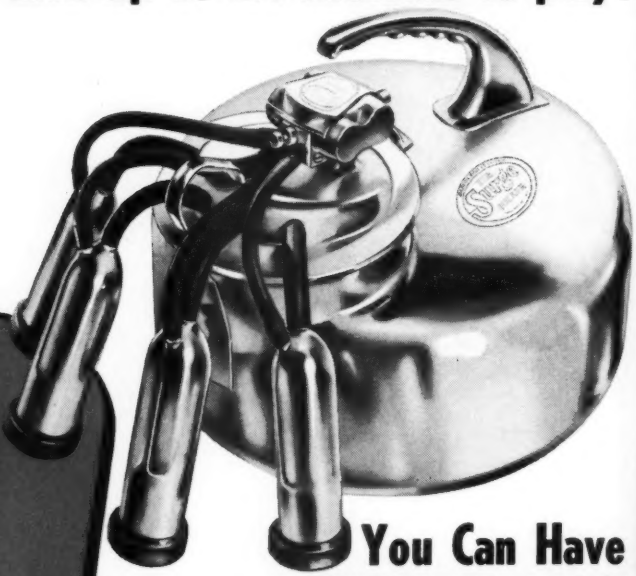

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Editor's Chat

THANKS FOR REMINDING US

Now and then a good spanking is deserved. The one you readers gave us is no exception. Many of you have proved during the past two months that you are really working at this job of safety. You recognized immediately the unsafe practices we displayed on our "front doorstep" of the March issue, where we showed a picture which, from a safety point of view, was about as bad as you could find. In the same issue, on this page, I expounded on the virtues of safe practices. It was good advice, I'll admit, but the only trouble was we didn't practice what we preached. And some of you didn't fail to tell us about it. Just between you and me, there isn't room on the next half dozen pages to get all the letters you sent us. We even got a few phone calls. Anyway, here are some of the letters:

"I like your magazine very much and I liked your article on safety, but look at your cover picture again. It doesn't speak very much for safety. One of the first rules of safety when working with machinery or around it, especially on the farm, is to watch out for loose clothing that can be pulled into equipment that is running. Loose shirt sleeves, loose trouser legs, loose overall bibs and straps have caused many nasty accidents, especially with corn pickers.

"Now I don't want to sound too critical, but I am for safety."

C. L. C., Zionsville, Ind.

"How inconsistent can you be? I was horrified when I picked up your March issue and saw the man with the loose floppy sleeves ready to be caught in the unguarded belts on his power tools. And then I opened to the next page and saw an editorial entitled 'Farm Safety'. Which do you think more people saw and looked over?"

M. L. Z., Taneytown, Md.

"I received our ELECTRICITY ON THE FARM Magazine today and after adjusting the thermostat on the electric chick brooder, I decided to look the little magazine over. After looking at the picture on the front page, I read the Editor's Chat on page 1—Farm Safety. I was a little amused at the way the lad on the cover was so proud of his one-motor tool table but felt sorry to think of what would happen if his loose sleeve cuff should happen to catch in one of the many belts.

"I have worked around a shop and may be careless about some things, but I am pretty careful about my shirt or coverall sleeves. I lost one $4 shirt in less than the shake of a lamb's tail."

J. T. S., Bozeman, Montana

"Death Trap! Did this lad get out alive dressed like he is?"

C. E. F., Bridgewater, Conn.

"In your March 1955 Editor's Chat article on farm safety, in last paragraph, it says that power machinery accidents are next to accidents caused by animals. Now look at the cover of this issue and note the loose sleeve on the operator's left arm. That's strictly against safety rules."

F. S. L., Muskogee, Okla.

Thanks to all of you who went to the trouble of informing us about this. We know that you have made us more conscious of hazards on the farm, and it might serve to remind you once again that safety must be lived to be effective.

BLOW ON YOUR HAY TO DRY IT

It's not hard to find examples of how moving air can cool and dry. Sometimes we get too much of it and lose a crop or see the best part of the top soil dry up and blow away. There are some practical remedies to help prevent loss and many ways to use air to improve farm practices.

One of these is to blow air, either as it comes naturally or with heat added, through hay or grain and so speed up the drying and curing process. The advantages are obvious and experience so convincing that it is now mostly a matter of deciding whether to spend the time and money to install barn hay curing now or put it off for another season.

If you do it NOW while the mows and grain storages are about empty, you not only choose a convenient, logical time, but get the benefits for this season's crop. Every year you postpone crop drying you take an unnecessary gamble.

May is National Water Systems Month. Pumping water and "toting" is a "good ole days" practice we just can't afford. It's too expensive!

Jim Rikard

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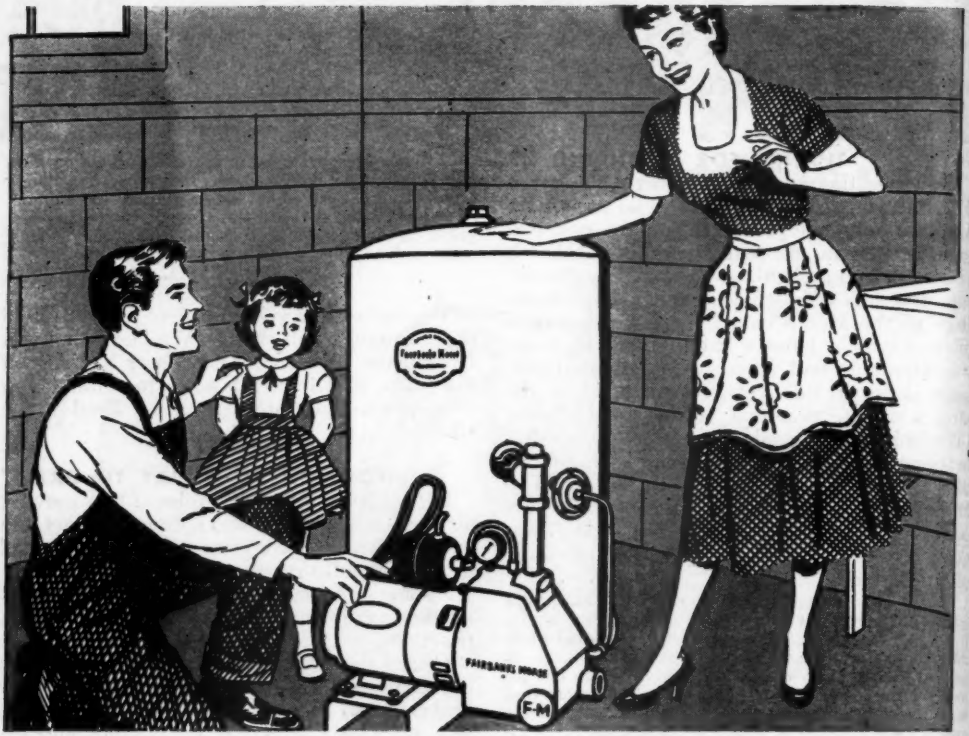

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Farm Feed Processing Pays

Grinding and Mixing for 2500 Layers Saves $20 a Day

By E. W. LEHMANN

The Clarence Schroeder family of Will County, Illinois, made electricity a member of their working team when they decided to go into egg and poultry production on their 160 acre farm in 1951. It was recognized that to make poultry production pay and provide a satisfactory income, they had to have a larger volume. With too little income from either poultry or cows, they needed more acres if they were ever to get adequate cash income from grain, but more acres were not available. Their decision was in favor of hens.

Their 40′ x 50′ barn was converted into a four floor poultry house. A stairway was built leading to each floor. A platform lift or elevator, operated with an electric hoist, was installed. By 1954 the Schroeders had 2,500 hens that were producing a daily average of 125 dozen eggs, which were sold for 44 cents a dozen. They grow 75 acres of corn, 45 acres of oats, and 30 acres of hay. The grain produced was found to be adequate.

At the outset the Schroeders were uncertain about the problem of feeding the poultry. They therefore bought ready-mixed mash which cost them from $96 to $110 a ton, 1952 and 1953 prices. By 1953, they were using a ton of poultry feed about every 36 hours. They decided then that the only way to make money was to quit selling grain and to use it right on the farm. The market price of corn was $1.50 per bushel, oats were 80c a bushel, and ready-mixed concentrates were $110 per ton in bulk. By grinding the grain and mixing it with the supplement on the farm, the cost would be $70 a ton instead of $100. This saving would be $20 a day.

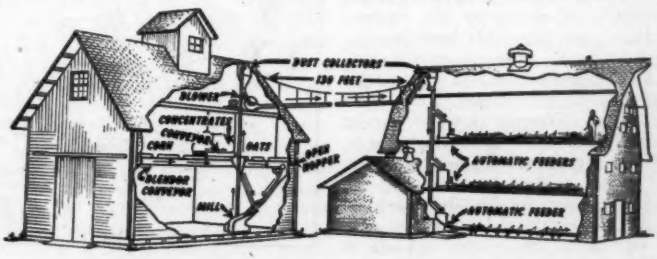
Like many other farmers, the Schroeders decided to save the grinding and hauling costs and the money they had been paying the feed man. They used the tractor and mill that had been used for grinding feed for the cows. The concentrates were bought and mixed with the grain by hand. The mixture was shoveled into the tractor driven mill. After grinding, it was shoveled into bags, carried or hauled in a wheelbarrow, and lifted to the four floors of the poultry house for feeding. This method of mixing, grinding, and getting feed to the four floors of the poultry house required three hours of back-breaking labor for two people for each ton of feed.

Ray Gault, an agricultural engineer with the local power supplier, came to the rescue. He drew a plan, utilizing the automatic electric grinding and handling unit, which had been developed by the agricultural engineers at the University of Illinois. The plan proposed was that automatic equipment be installed in the corn crib located more than 100 feet from the poultry house. It is a typical double crib with oats, corn and concentrates stored above the driveway in bins. The plan devised employs flexible mats which are drawn under the material. These mats meter the material in amounts to meet the requirement of the ration. All materials are ground and mixed in one operation.

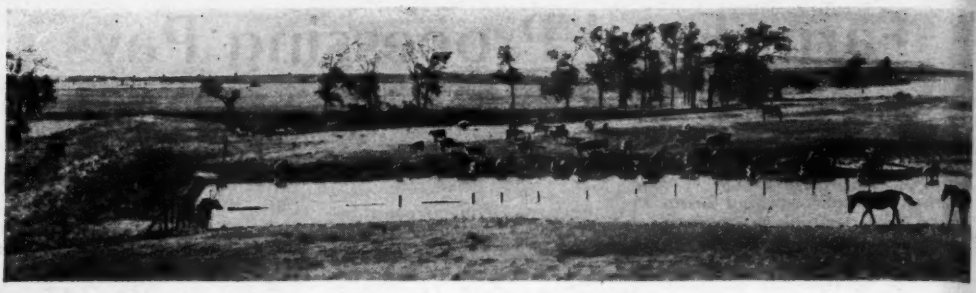
The hammermill is equipped with a blower which is an integral part of the unit. The blower elevates the ground feed to the top of the storage building into a dust collector. Here an auxiliary blower delivers it a distance of 132 feet through a five inch galvanized pipe to the top of the four story poultry house. Here it is discharged through another dust collector to storage bins. From these bins, the feed is fed by gravity to the automatic feeders below.

Ray Gault and Clarence Shroeder adjust the hammer mill setting. Note the Helix conveyor and blender on the ceiling.

The unit is completely automatic. All that is necessary is to make certain that materials are available to be ground, set the timer to grind long enough to meet the daily need, and press the starting button. The system is simple—no labor is required to operate it, there is no shoveling or lifting, and the cost of electricity is only a few cents for each ton of feed.



Sketch of the Shroeder automatic feed grinding and handling installation.



More farm ponds are being built every year to provide water for livestock, irrigation, fire protection, and even recreation.

Water Conservation Starts on the Farm

By C. D. LEITER

Soil and water are the two basic requirements for successful farming. In any seasonally drought-stricken area the order of their importance is water and soil. As a team, working together and helped by good farming practices, they bring full crop production.

The many increased demands and uses for water almost immediately indicate a decreasing supply. The constantly increasing population with its direct needs, together with the vastly greater municipal and industrial requirements, have only emphasized the shortage of available water supply.

In many instances these demands have caused a definite shortage in many areas. Added to this load is the greatly increased farm usage for irrigation, livestock production and processing, dairy production, fruit and vegetable processing, dairy and barn cleansing, fire protection, together with household use for improved living, health and sanitation. Surely every phase of farm operation and production is dependent on plenty of water at the proper time and place for best results.

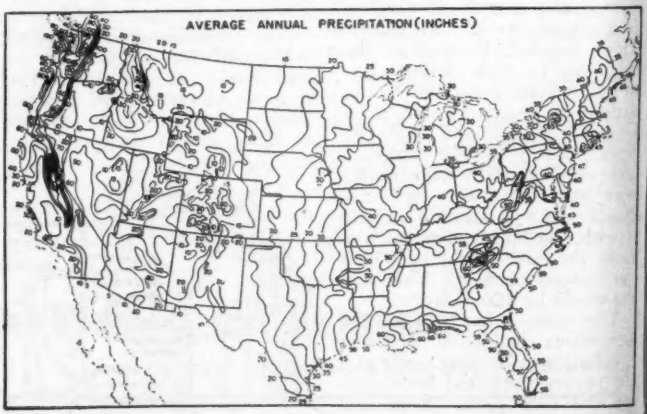
On an over-all population basis, it is estimated that in the U. S. we use about 1,000 gallons of water per day per person for municipal, industrial, farm, and individual home purposes.

For many generations we have been recklessly wasteful of all our natural resources, and especially of water, which is certainly one of the most valuable. Collectively, we have done everything to hasten the run-off and to get rid of water as fast as possible. We have cut down forests, tiled and drained land, straightened water-ways to accelerate flow, and built storm sewers to dispose of city rainfall quickly.

Many agencies—federal, state, district and local—and many organized groups are working together to correct the situation before it becomes definitely perilous.

We learn too that many farmers cooperate with the Soil Conservation Districts in their outstanding and continuous effort to improve water resources. Such effort is only as successful as the individual cooperating farmer makes it. It can only be successful for the preservation of our agriculture when all farmers recognize its importance. Each of us, of necessity, must become interested and active in the preservation of these resources right on our own farms. This can and must be done in cooperation with existing agencies and neighbors, and in harmony with the existing laws concerning Water Rights. Where present laws do not properly preserve and protect water resources and their use, active effort should be made for changes or for new measures to provide such protection.

From voluminous reports of proceedings of such groups as the Joint Legislative Committee on Natural Resources of the State of New York, the Third



Average annual U. S. rainfall as recorded during a 40-year period. (Source, USDA). Conservation permits maximum use of this water.

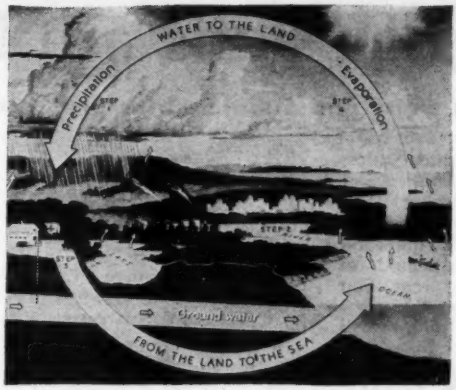
Annual Ohio Water Clinic, and other local, state and federal agency reports, it is immediately shown that the Water Rights of the farmers are not clearly defined by legislation or by court decisions.

Since the time of Mohammed the prophet, the first rights to water belonged to the owner of the land where the water was found, but with the direction to make such water available to his neighbor for the use of his people and livestock after the owner's needs were satisfied. Possibly these basic riparian rights are the basis for our present laws which are now apparently proving inadequate.

With the greater farm demand now becoming more pronounced with the advent of general irrigation, even in the humid areas of the country, the rights to water are again seriously questioned. This is more especially the case as the water may be diverted from its natural watershed or used at the expense of downstream farmers. Clarifying legislation and revised usage laws are needed in most of the eastern states. This fact is the basis on which many studies are now being made. Farmers and all water users should be fully acquainted with what is being planned and what is being done in their state in this direction.

The Soil Conservation Service of the United States Department of Agriculture concurs in the conclusion that there is no standard answer to the question of water rights, since some states have no clearly stated water code, and there is wide variation among those that do. It is suggested then that you should check with your county agent, soil conservation group, or other agricultural authorities, to determine the status of water laws in your particular state before you invest any appreciable money or effort in improvements that utilize stream flow or underground water.

It is recognized that the increase in the nation's need for food, feed, and fibre must come largely from increased yield per acre. Up to now, water has been the one unpredictable factor in crop yield. With irrigation, which is simply the storage and deployment of rainfall for use when most needed, that factor can be controlled. It can also be resolved without hardship on anyone and with every favorable effect so far as flood control and other serious water damage is concerned.



The hydrologic cycle according to modern meteorological evidence.

The nation's concern about water resources has turned our attention to water *quality*, as well as *quantity*. We are now attempting to prevent and abate water pollution as a means of keeping the water we possess in a clean, useful condition.

It is interesting to note that industries and municipalities are cooperating in making antipollution laws effective by studying ways and means to improve the situation. They are not only concerned about sewage and manufacturing waste pollution, but also in conserving water by improving their processes and techniques. Generally speaking, all factors involved are working together to resolve the problem—not only regarding water rights but the equally important matter of using these rights and the water itself in the best interests of all of the population. We, as farmers, then, have the support of all interests and must lend our support to the common cause.

It is also most heartening to note that the many groups and individuals who are conscious of the water shortage problems are beginning to coordinate their efforts at literally the grassroots level, and are attempting to interest all citizens in the projects. For example, the Ohio Forestry Association has recently recommended these initial steps:

"Formation of a citizens' committee in each watershed to adopt an over-all policy regarding their community needs and potentialities.

"State and federal cooperation towards an inventory of water resources.

"Broadening of conservancy districts to develop within the watershed integrated water supply, flood control, drainage systems, and methods of soil and forest management.

"Evaluation of present water use laws to provide for the equitable distribution of available supplies among competing interests."

Farmers can and must have a voice in such programs and must work collectively through their various organizations and the conservancy districts to secure the "equitable distribution of available supplies." This effort must be in cooperation with municipalities, industries, and all others, since the total population is the area of the farmer's livelihood.

Right now we can, as individual farmers, begin to do the many obvious things to be done on our own farms. We can build ponds or enlarge existing ponds. These ponds yield immediate returns in water available for livestock and irrigation during dry seasons and for fire protection. As has been proved, it does not take acreage out of production but adds income or food in fish produced, as well as pleasure in water sports. These are in addition to the increased income from livestock and crop production made possible by the additional available supply when other sources are inadequate. When you plan your farm pond, do not make the mistake of smallness—make it larger than seems necessary—

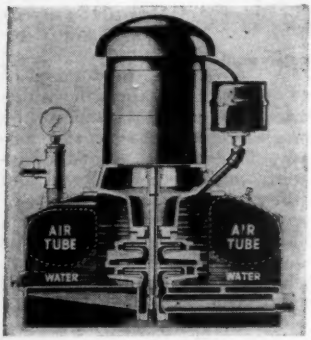
. . . . . (More on page 31)

Pump Designs are Changing

Jet Units and Submersibles are Setting the Pace

By KENNETH L. McFATE

Throughout the United States, over 750,000 farm water systems were sold during 1954. About 25% of these were replacement pumps. As the 1955 pump sales are expected to exceed those of last year, you may wonder whether the number of replacement pumps will again be as high. Probably it will, for even though a good number of these have served their useful life, far too many of today's replacements are needed because of improper selection and installation of the original equipment.



This small capacity (cottage) system uses an air-filled rubber bladder as a permanent air cushion. No air valve control is needed. It has a ½ hp, two stage centrifugal unit with a 5 gal. tank.

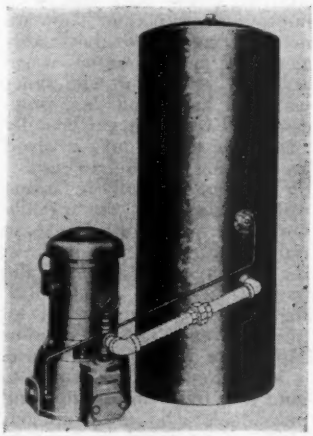
What type of pump should you buy? What type is the most popular? If we were to let 1954 pump sales be our guide, we would probably buy a centrifugal jet. According to available sales data, about 70% of all pumps sold last year were shallow and deep-well jet units. Plunger pumps accounted for 23%, submersibles, 7%.

You should not, however, select a pump by its sales record or popularity. It should be selected for the service that it can give to your farm business and home comfort within the limits of the well conditions. After all, when you invest in a water system you are, in reality, buying a service—a service of automatic livestock, poultry and garden watering and of hauling and distributing many tons of water into the house each year.

Cottage Systems

Several manufacturers are now making small capacity water systems for summer cottages or for use as booster pumps where pressure is found to be inadequate. Even though most of these have at least a one gallon capacity storage tank, they are often referred to as "tankless" systems because the cushioning chamber is built in as an integral part of the pump. These are usually manufactured in ¾ to ½ hp sizes and are primarily used for shallow well service. One unit even incorporates a small electric water heater, which results in a hot and cold water system.

During the past several years there has been little change in piston or plunger pumps. Capacities of these, like others, have increased so that the smallest commercial units of some manufacturers are 300 to 350 gallons an hour. Some pumps are of a heavier construction in order to withstand higher working pressures. Likewise, there have been improvements in seals around the piston rod.



The convertible (for shallow or deep well) jet systems are compact and streamlined. This unit can be mounted either over the well or offset in some adjacent location.

Jet Pumps

Jet pumps, in general, have characteristics similar to centrifugal pumps. In fact, a jet pump is actually a centrifugal pump with a jet (similar to the nozzle of a garden hose) attached. As water passes down one pipe, it goes through this small nozzle at a high velocity, creating a vacuum. This vacuum pulls more water from the well up to the pump where the centrifugal impeller picks it up and runs through a new cycle.

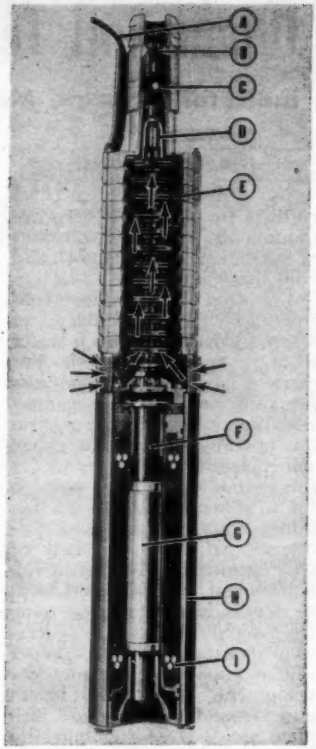
All jets are basically the same. For shallow well installations the jet assembly is located near the pump; for a deep well, the jet is down in the water. Because of the basic designs used on jet pumps, there are few changes that have been or can be made. Nearly all manufacturers are making rotary seals that prevent leaks around the impeller shaft.

Most of the new jet pump units are compact. Many manufacturers are making convertible jet pumps, designed for either shallow well or deep well installations. Consequently, if the water level lowers, it is often possible to convert from the shallow to the deep well type by moving the jet assembly from the pump into the well.

Submersible Pumps

The most recent development in the farm water system equipment field is the submersible pump. In many areas there has been a definite trend toward its increased use. These units have the pump and motor submerged under water. They are both suspended near the bottom of the well by the vertical drop pipe through which water is forced to the pressure tank.

While this type of pump has been in use for over 30 years, it has become popular as a part of the farm water system only dur-



A cross-sectional view of a typical submersible pump and motor. Principle parts are identified as follows: A—electric cable; B—discharge outlet; C—check valve; D—upper bearing; E—impellers; F—motor shaft; G—water-cooled motor rotor; H—motor casing and I—motor windings.

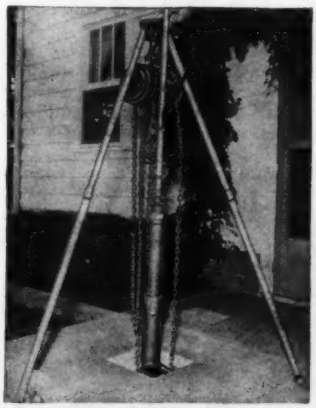
ing the last 5 or 6. As late as 1950 there were few of these in use for pumping drinking water. In 1954, there were about 50,000 sold for farm use.

There are several reasons for the demand and acceptance of the submersible pump. Because of increased volume, manufacturers can now make these deep well units at a cost that is competitive with other types which have the same capacity at a given discharge pressure. This is particularly true when used at pump settings of 150 feet or more. There are other features that users like. Located below ground, it cannot be seen or heard. It is relatively easy to install and the pump house can be eliminated, if desired. When properly selected and installed in a good, clear-water well, it will give many years of trouble-free service. Experience has shown that where there has been trouble, it has generally been due to misapplication and improper selection of equipment. In many instances, the pump was installed in a weak well and often too near the bottom. As a result, the water level was lowered to the point where the pump drew in sand and other abrasives, causing damage to pump and motor.

Before selecting a submersible, you must make sure that there is plenty of water flowing into your well. Submersible pumps are not designed for a 2 or 3 gallon per minute well.

If you have a new well, your driller will be able to tell you how much it will yield. He will also be able to tell you whether or not the well is free of sand held in suspension. If, by proper well development and the use of the proper size well screen, the water cannot be kept free of sand, the submersible should not be used. Like all centrifugal water systems, a large amount of sand will ruin both the pump and the motor.

If you are selecting a new pump for an old well and do not know the yield, you can have your water system dealer check it by pumping with a large capacity pump.



The submersible pump and motor is about to be lowered into the well where they will be suspended by the galvanized iron drop pipe. As it is lowered, the submarine-type electric cable is taped to the pipe at 8 to 10 foot intervals to avoid "pinching" the wire insulation between drop pipe and casing.

Because of their "in-the-water" location, all submersible units are water cooled. However, some pump motors are oil-lubricated while others are water-lubricated. The oil-lubricated exclude well water and the motor runs in a special highly dielectric oil which fills the inside of the motor. Consequently, the motor windings, bearings, and the rotor are submerged in an oil bath.

Some of the motors that use well water as the lubricant seal off the rotor by a stainless steel or plastic inner-liner which prevents the water from getting to the windings. Others depend on the insulation of the individual wires. While water-lubricated pumps are subject to water conditions, the parts of the pump are made of corrosion resistant materials (bronze and stainless steel). The single phase motors are of the capacitor type with capacitors mounted in a control box above ground or near the tank where controls can be easily inspected and serviced when needed. The three-wire submarine type cable connecting the pump and box is color coded for correct polarity.

These pumps can be used in wells of 4 inches in diameter and larger. While they can be used at nearly any depth, the practical limit for domestic purposes is about 400 feet.

The trend in both manufacturing and use is toward larger pumps. If you have an ample water supply you should select not less than a 500 gallon per hour pump. If the supply is weak you may need to use a small pump and large storage tank. But whatever pump you select, it should be geared to your well conditions and your farm's requirements.

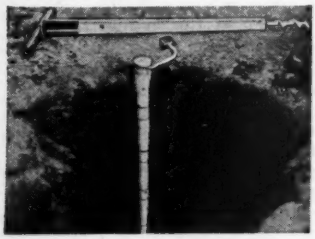
Talk over your problem with a reliable water system dealer, your country agricultural agent, or vocational agriculture instructor. Find out all you can about the old and the new types of pumps that could be used on your supply. Carefully weigh the advantages and disadvantages of each. Remember that there *is* a pump best suited for your well. The important thing is to find the right one.

Irrigate When Soil Tells You

Resistance Method Indicates Accurate Moisture Conditions

By R. LARRY ROWSE

Irrigation used as a preventative rather than a cure can pay big dividends. Recent advancements in engineered irrigation systems have made sprinkler irrigation a feasible farm operation under a great variety of conditions. However, there is more to irrigation than just the physical application of water to growing crops.



Carrot-shaped or conical type stake installed in soil with tapered auger and reamer on ground surface. Circular plugs with electrodes imbedded in plaster-of-Paris spaced at six-inch intervals. The dark rings are plastic spacers insulating each unit. The stake is two feet in length.

Water alone does not solve the many problems involved in obtaining maximum yields from a given crop or acreage. There are many contributing factors equally as important that influence increased production. Among these influencing factors are the application of water according to individual crop requirements and the capacities of the various soils to absorb and hold that water.

Irrigators have been long confronted with the problem of when and just how much water to apply to specific crops. For many it has been a hit-and-miss proposition—a guessing game—with production dependent upon the operator's ability to gauge soil moisture conditions. Under these conditions it is possible for a system to become a liability rather than an asset. Excessive irrigation on tiled or well drained soils will leach valuable plant foods and fertilizers to depths below the root zone. On poorly drained soils, excessive moisture prevents proper soil aeration affecting root development, the general health and vigor of the crop and ultimate yield. Over-irrigation also increases labor and power costs and wastes precious water. On the other hand, under-irrigation or even poorly timed applications limit growth, reducing both yield and income.

An accurate knowledge of soil moisture conditions throughout the root zone facilitates timing the frequency and gauging the exact amount of water to apply. Timing the irrigation and determining the quantity to coincide with the soil deficit and the crop requirements is the key to the success of any irrigation program. These factors must be given careful consideration if the incredibly high yields possible with proper irrigation are to be achieved.

One of the simplest ways to determine the moisture content of the soil is by the electrical resistance method. The technique is feasible and practicable and easily adapted to farm use.

The equipment consists of a gypsum soil-contact unit and electrical resistance meter. The soil units may vary in size and shape, according to the manufacturer, but basically consist of two electrodes imbedded in plaster-of-Paris or gypsum. When the unit is buried in the soil, the gypsum readily simulates changing moisture conditions of the surrounding soil. Since the electrical resistance will vary with the moisture content of the gypsum, it is comparatively simple then to measure the precise resistance at any time. The resistance encountered is then converted to the moisture content of the unit and surrounding soil.

With a little effort and experience, any grower can determine the appropriate timing of irriga-

Joe Serres, Woodburn, Oreg., making the tapered hole for the soil contact unit.

Serres placing soil contact unit in tight-fitting tapered hole.

Serres and Rowse recording soil moisture readings from resistance meter.

tions in accordance with crop needs and soil capacities. He can determine the amount to apply and can also predict well in advance approximately when subsequent irrigations will be needed.

The initial investment in an irrigation system and the crop investment are too great to be left to chance irrigation. Soil moisture determinations are admittedly an all-important link in boosting yields and making irrigation pay big dividends. But even so, they are not the complete answer. General farming practices, cultural methods, fertilization programs, insect and weed control programs will, of necessity, have to be molded and interwoven with the irrigation program in order to achieve maximum benefit from each individual farm operation.

Close-up of the Irrigage equipment manufactured by Rayturn Machine Corporation. The electrodes are buried in the small area between the two spacers. The first plug is six inches below ground level when installed.

A single cutting of alfalfa requires 326,000 gallons of water per acre to grow it. An acre of cotton needs 800,000 gallons to mature a crop.

The main climatic influence on tomato growth is night temperature, 62 degrees being the most favorable for the production of large tomatoes.

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Mow Drying Saves More Leaves

Quality Hay With Heated Air

By A. V. KREWATCH

In this time of need for minimum costs of production, quality roughages are most important. That is why good hay and silage for cows is a must on the 1400 acre dairy farm of Mr. and Mrs. Charles W. Collier, near Darlington, Maryland. Their herd of 210 milking cows produced 198,702 pounds of milk during December 1954.

Efficient management in the field is stressed by Mr. Collier. He also emphasizes the value of artificial drying for producing top quality hay. How else can you save all the leaves? They are the most important part of the hay. Actual samples of good alfalfa, by weight, run 57 per cent leaves and 43 per cent stems. If we take this as a fair figure from which to start, then 4/5 of the protein, ⅘ of the total digestible nutrients, 4/5 of the calcium, and ⅘ of the phosphorus is in the leaves. The leaves also carry most of Vitamins A and D.

Here's how a mow hay drier can pay for itself. Take a field that will yield 3 tons or 6,000 pounds of dry hay with no loss. Suppose from that field you make No. 1 leafy alfalfa hay, which is composed of 50% leaves rather than 57%. You then bring in 5,160 pounds of hay instead of 6,000 lbs. You have lost 840 lbs. of the "cream" of the crop —leaves. The linseed meal equivalent required to replace the lost protein would be 462 lbs. The corn equivalent to replace the total digestible nutrients lost would require 572 lbs. or 10 bushels. Suppose you make only US No. 1 hay—40 per cent leaves. You would need 936 lbs. of linseed meal to make up the digestible protein loss and 1157 lbs. of corn to make up the total digestible nutrient loss. As the leaf loss increases and on down to rained on or poor hay, increasing amounts of linseed meal, corn or other concentrates would be needed to replace them. A mow hay drier helps keep hay losses to a minimum, and quality at a maximum. That is why many farmers say, "I have never bought a piece of equipment that has made me as much money, dollar for dollar, as my hay drying fan."

Many of us have a favorite recipe for something delicious. Our animals have their favorite feed. Mr. Collier's recipe is one good dependable fan or blower, an electric motor to drive it, a generous helping of good management, a supply of heat, and a burlap cover for the stack of drying bales. Mr. Collier dries baled hay on three units, one in each of three of his barns.

Collier emphasizes the value of using heat to get quick drying for quality. He says you must also be able to bring hay in, at times, a little on the damp side in order to save the leaves as well as prevent rain damage. This past year he sold his extra production, grass legume mixture or alfalfa, for an average of about $55 per ton. He feeds large amounts of silage.

Ten tons of hay can be dried at a time in each barn at an average oil cost for the season of approximately $5 per ton. The time required for drying is about three days. Saving all the leaves possible adds to the protein content as well as quality. He uses burlap over the stack of bales because it prevents the

Above: The main fan and motor is in the hay mow at the front corner where the doors in the end wall are open. The oil burner and its fan is in the small room at the side. A flip of a damper will direct the flue gases outside or through a spark filter into the intake of the furnace fan and on through the large blower and through the hay. The entire installation is well protected with safety devices.

Right: Charles W. Collier, Indian Spring Farm, Darlington, Maryland, spreads a burlap cover over the stacked bales of hay to prevent air loss and speed up the drying of the top layer of bales. Work at the University of Maryland showed that this practice cuts the drying time of the top layer in half.

escape of air from between the bales and speeds the drying of the top layer. "I prefer 4 or 5 bales high for best results," states Mr. Collier, "but at times have piled the bales 6 high."

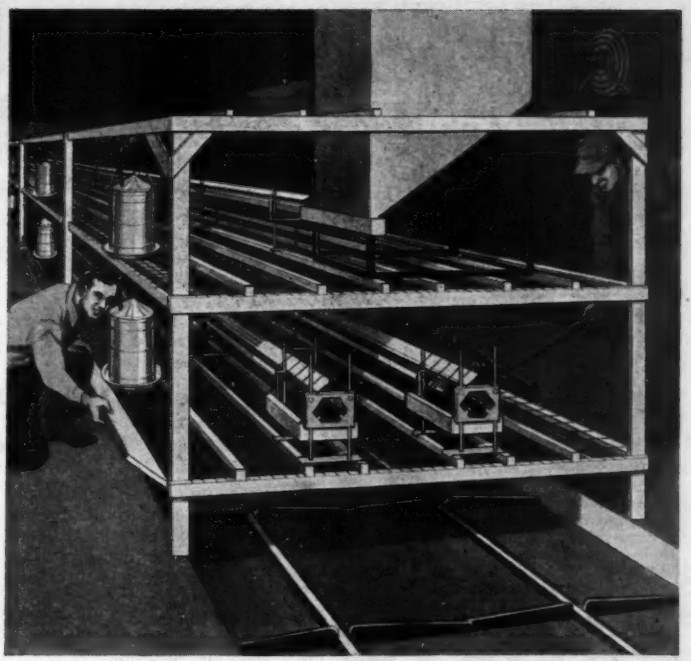
In each barn there is a slatted floor area, 20 ft. by 30 ft., with plywood walls around three sides of the drying floor to prevent air loss. Each large fan is controlled by a resetting safety switch. The oil furnace can only operate when the large fan is operating and a connecting relay is closed. Also, the oil furnace can only operate when the oil burner fan, which feeds hot air to the large fan, is operating. The stack of the oil burner is so constructed that the flu gasses can be exhausted or turned into the cold air intake which is covered by a spark filter. The air duct leading from the furnace to the large fan intake is equipped with a safety gate held by a fusible link that will release at 250 degrees. The oil burner is equipped with the usual safety controls.

Mr. Collier added a few words of wisdom from his experience. "Don't make the bales too tight. Keep from piling up hay in the field that will prevent uniform drying. Have ample air for fast drying especially when using heat. Then, a simple but well engineered drying system will give you the recipe for some of the best hay you have ever seen in your life. The real objective is more tons of hay that will make more milk per ton. That is why we have ready sale for all the top quality hay we can spare."

DHIA Gross Incomes Stay at Same Level

In spite of a drop in the price of milk and manufactured dairy products during the past year, Dairy Herd Improvement Association members maintained their gross income from the sale of dairy products.

This was done with increased size of herds and increased average production per cow. The average number of cows rose to 20.6 per herd. Average production rose to 9,044 pounds of milk and 361 pounds of butterfat per cow. Gross income averaged $7,086 per herd.



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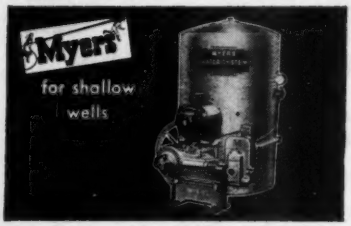

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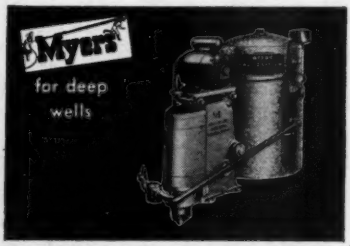

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Death to Flies

Electric Killers Do a Positive Job

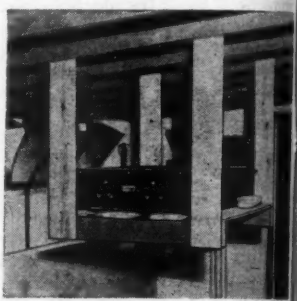
By **BRUCE FEARN**

Flies are more than a nuisance. They are carriers of disease and cause economic losses. These things have been recognized by good farmers for a long time. And good farmers have been putting up the good fight against flies as a regular part of their management program.

But flies, like the whole insect kingdom, are hard to beat. Probably the best that can be hoped for is to keep their damage level as low as possible.

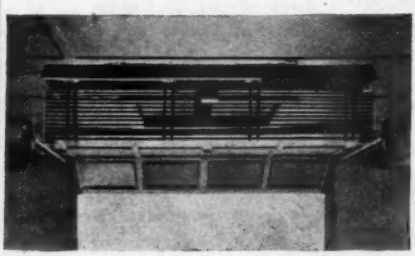
During the second World War, with the introduction of DDT, it appeared that the fight was won. For farmers, it was simply a matter of mixing a small amount of the new miracle material in the whitewash and flies were absent for the rest of the year. Then immunity set in. Some flies were exposed to DDT and did not die. They passed that immunity along to their offspring. As a result we have a whole new breed of flies on which DDT appears to have no effect. The same immunity has developed when other miracle materials have been used. And, as of now, there seems to be no reason why flies cannot overcome such materials as fast as they are introduced.

But there is no immunity to death. The electric fly trap combats flies relentlessly. A fly that contacts the electric fly killer passes nothing on to its offspring because there are no offspring. The fly is dead—permanently.



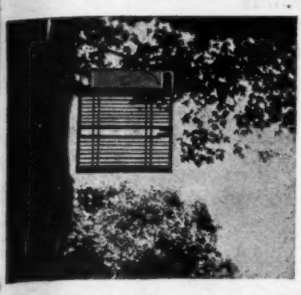
The tray type electrocutor can be set down anywhere. Here it keeps down the fly population near a window.

More farmers every year are appreciating the good work that the electric fly killer is doing around the farmstead. Mr. Ernest Fetzer of New Hope, Pa., for example, reports, "We are not entirely free of flies but with our



Dan Cooper suspended his electric grid fly killer from the ceiling of his dairy barn.

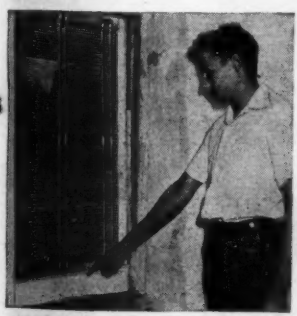
electric fly screens we have the fly population down to a point where the place is clean and the livestock is comfortable. And I



Ernest Fetzer hung this outdoor unit in a tree. It is equipped with a special "blue light" which attracts insects away from the people sitting on lawn chairs nearby.

believe my fly electrocutors will do this for me every year because flies just cannot become immune to the electric fly screen." Mr. Fetzer also used an electric bug killer on his lawn so that folks could sit out there in the cool of a summer's evening and enjoy the relaxation without being pestered with night flying insects. Mr. Fetzer said, "I have never seen anything like it. The bug electrocutor, which was hung in a tree, was sparking continuously and bugs were falling to the ground like snow."

Mr. Dan Cooper of Gardenville, Pa., has been using the electric fly killers for quite a while now. He says, "Sure we have flies around the farm. But you'll find most of them in the electric fly traps—dead. Also, I can operate all the traps for a whole season for the price of a gallon of spray. And think of the labor that's saved!"



Peter Fetzer points to a ½ day's "kill" on the window sill. This electric killer is the screen type used in place of a regular window screen.

All this bears out the comment in the USDA Yearbook for 1952 entitled "Insects"—quote—"House and stable flies attracted to a bait in an electric grid box trap have been destroyed at the rate of 100,000 per day."

Electric fly killers are available in several types. There are those that fit into a window in place of the regular screen. Others hang over a susceptible area like a walkway where cattle pass. Still others are on top of a baited pan which is set in an infested area like a feed room or a manure shed. Then there is the new development for night flying insects which does such a good job at swimming pools, patios, roadside markets and the like. In short, they are designed to fit almost any need.

But no matter what the shape or design, there is one thing farmers know—flies never become immune to the electric fly killer.

Milk Can Hoist

A ½ hp electric motor provides the "backbone" for this handy milk can hoist built by Samuel Wilson, Street, Mary-

land. A belt drives, with sufficient reduction, the drum around which the rope winds. Wilson built the "rig" so the belt will slip at a pull of 225 pounds. This was done to provide for safety in case of mishap. When the hoist raises the can clear of the cooler it is pushed out to the loading platform by means of the overhead track. "Sure takes the backache out of milk handling," says Wilson.

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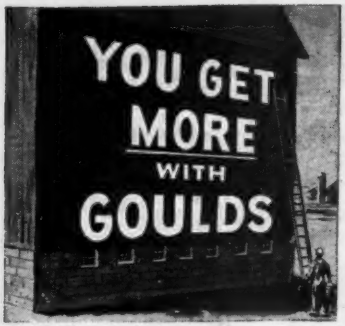

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Automatic Egg Vender

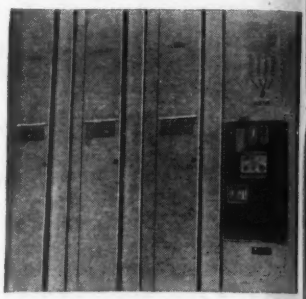
By M. O. WHITHED

Poultry farmers can now market their eggs with an added profit to each dozen with very little time involved. On the Heinen poultry farm, located on Hook Road, near Pennsgrove, New Jersey, and on Danziger's poultry farm, located on Route 322, about a mile from Glassboro, New Jersey, there's a machine known as the Egg-O-Mat. This machine permits the farmer's customers to help themselves to fresh country eggs. The Egg-O-Mat is able to dispense four different sizes of eggs for the customer by merely flicking the selector switch to whatever size he wishes.

Mr. and Mrs. Danziger say that the Egg-O-Mat saves them many hours a day from waiting on customers. This leaves added time that can be used for other chores about the farm.

The Egg-O-Mat is housed in a roadside building and is open to the public 24 hours a day. The building, which is an 8′ x 10′ insulated structure, is air conditioned during the summer months in order that high quality eggs may be maintained. Danziger says that the machine has sold as much as 8 to 10 cases of eggs a day and he is looking forward to an even greater output when news of the Egg-O-Mat is better known.

The Egg-O-Mat, manufactured by the S & S Vending Machine Co., located at San Jose, California, is very easy to operate. The Egg-O-Mat operates in a manner similar to the self-service cigarette, candy, sandwich, and milk vending machines which are on the market. The customer selects the size of egg he wants to buy by turning the selector switch to the size indicated. By placing the money in the coin box slot, a dozen eggs will appear at the door of one of the cabinets to the left of the coin box. The cabinets are marked to coincide with the size of eggs selected.

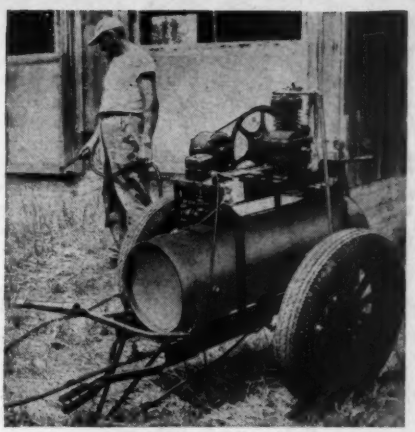


A close-up of the coin box with the selector button above. Note three cabinets to left housing extra large, large, and medium eggs with the dispenser door mid-way in the cabinet.

At the present time, the customers place 60c in the coin box by using two quarters and one dime and any change necessary will be found in the box containing the dozen eggs. The change is varied according to the market price of eggs.

Mr. and Mrs. H. M. Danziger in front of the building housing their Egg-O-Mat machine. This building is insulated and will be equipped with a window air conditioning unit for summer months.

Compressor For Farm Spraying



John Bahnsen of Petaluma, Calif., operating his compressor, spraying weeds along poultry houses.

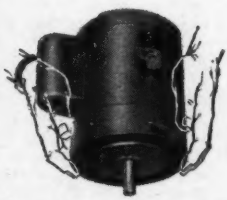
An electrically operated compressor is considered by John Bahnsen and Frank Howe, Petaluma, California ranchers to be the handiest piece of equipment they have. They built the unit themselves using an electric ¾ hp motor and compressor unit out of an old refrigerator. This unit sends compressed air into an old 40 gallon water tank, set in horizontal position on a two wheeled trailer.

The compressor has a shut off valve which causes the unit to start at 30 pounds pressure and off at 60 pounds. The unit is equipped with a 50 foot hose.

The air release valve is at the rear and the filling pipe is on top, at the front of the compressor unit. There is a handle at the front to allow for moving the rig about by hand. A tongue was fitted to the trailer so it could be pulled about by a tractor.

These two ranchers use this compressor for a wide variety of things. Mainly for spraying the walls and ceilings in their chicken houses three times a year, the nests as often as needed, to keep fleas and mites under control; for blowing dust out of brooders after each brooding season; for spraying weeds around all buildings, along driveways and fences.

It works like this. The tank is the reservoir for both the compressed air and the fluids they spray. The tank can be filled almost completely full of liquid if they are working where the electric motor can be plugged in and kept working to operate the compressor continuously. The compression of air works against the liquid immediately forcing it out in a spray. If it is desired to use the sprayer at a point where there is no electricity available the tank is given only 20 gallons of solution. The compressor then builds air up in the tank until a 60 pound pressure is obtained. The rig is then taken to the work site and there is enough air pressure in the tank to spray out the 20 gallons of solution. Water, run through the tank under pressure, cleans out solutions.



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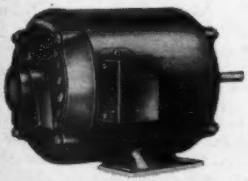

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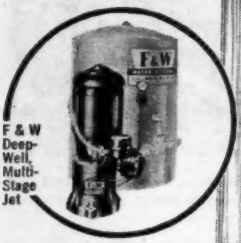

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FARM-USED, FARM-PROVED SINCE 1866

Water Bowl

Double-duty waterer, one of six installed on the Chardon Farms near Grayslake, Illinois, is placed so animals in two pens can be served by a single waterer. To simplify the installation of the six electrically heated and thermostatically controlled waterers, farm manager George Robb constructed a form which made pouring the concrete for the pedestals an easy job.

Ground heat, as well as electric heat, is utilized to provide attention-free winter watering with this waterer. In outside installations the pedestal and waterer are placed over field tile

which extends below the frost line. Ground heat rises within the tile to keep the water line from freezing, and a 150-watt heating element keeps the bowlful of water from freezing even when temperatures skid to the below-zero mark.

Bulk Tanks Cut Cost

The old familiar milk can is on the way out and is being replaced by the refrigerated bulk tank of from 100 to 1,000 gallons according to a survey.

Bulk tanks cut labor costs on the farm by as much as ¾ cent per quart. Quicker cooling lowers the bacteria count, and the butter fat content is increased by the elimination of fat stickage in cans.
New Mexico Extension Service

No man need worry too much about what's ahead of him if he has a good woman behind him.

EVERSTOPTOTHINK?—Many of the movies you see on TV are like old furniture, either EARLY AMERICAN or OLD ENGLISH. And speaking of TV, here's a little JINGLE-JOLLY we found in Charlie Jones' Laff Book. It goes like this: "There was a young lady from Trent, Whose TV antenna got bent, Her neighbors went crazy, Their screens all got hazy, For INSTEAD OF RECEIVING, she SENT." . . . . . SODDEN THOUGHT: a GOOD wife laughs at her husband's jokes NOT because THEY are clever—but because SHE is . . . . Then there is the story of the dentist whose sense of humor RUINED him—he pulled TOO many GOOD ones . . . . Here's one—author unknown—that we like—TITLE: REWARD FOR PHINDER—"Lost, the EPH key phrom my typewriter. Phour bucks reward phor return oph same as I phind it very unhandy and phor that matter a little undigniphied trying to make out without it. Signed, Phrank Phuller." . . . . A sleepwalker is the only person who gets his rest and exercise at the same time . . . . NO-TRUER-WORD-WAS-EVER-SPOKEN DEPT.: A LOT of money is TAINTED—taint yours and taint mine! . . . . We've just about decided that SOME gals talk so fast they say things they haven't thought of yet . . . . Reminds us of the garbled comment that came to the host as one of his guests took his leave of the party. Said he, "I had a fine time. I feel a heck of a lot more like I do now than I did when I came!" . . . . Jesse Livvin sez HE knows a fellow who is SO lazy he can't even keep his self-winding watch running . . Ma Larkey sez the only thing sweeter than receiving praise is the feeling of having DESERVED it . . . . SNICKER-SNORT-OF-THE-MONTH: The hard working wife was out hoeing the garden in the blazing sun when a passing neighbor stopped to inquire, "Well, Mary, does your husband still take things as easy as ever?" "My husband has only two regrets in life," came the weary reply, "one is that he has to wake up to eat, and the other is that he has to stop eating to sleep." . . . . . .

Your pun-peddler—DUFFY.

Stanley Igel, left, and King Allen adjust their cooling system on poultry house roof. This sprinkler will lower inside temperatures 10 degrees within an hour.

Cool From the Top

Hot weather doesn't worry poultryman Stanley Igel, of Estelle Manor, N.J. as his birds are protected by water-cooled houses. Although the entire system (including artesian well, pump, two tanks, pipe, and sprinklers) cost him $3000 to install, he claims it doesn't owe him a cent as it paid for itself within two years.

Igel got the idea for cooling the buildings when he lost 500 to 600 birds in a 1950 heat wave. He put his earlier agricultural engineering experience to work and devised a pipeline across the front roof of the buildings that would sprinkle the roof with cold water to lower inside temperatures.

A 1¼ inch pipe carries water from the pump on the ground floor, operated by a 5 hp single phase electric motor, up to the roof. The buildings are 350 feet long and slope toward the rear. One-inch pipe is used for higher pressure for three-quarters of the length. One-inch nozzles, carrying ⅛-inch sprinklers, are tapped into the pipe every two feet for the entire length. Wooden blocks holding the pipeline off the roof are six feet apart.

Each pipeline has its own shut-off on the roof for emergency use. Shut-off is installed at point where pump pipeline joins sprinkler pipe. An iron rod is also attached nearby in order to turn sprinklers into the wind for full benefit.

This system is for emergency use only and when a heat wave is being experienced, Igel starts the pump and the cold water sprinkling onto the roof will cool down the interior of the building 10-15 degrees within an hour.

Igel has an artesian well with a 6-inch casing. As a large amount of water is needed in a hurry, water is stored up ahead of time in two tanks, a 250 gallon tank in the pump room and a 750 gallon underground tank.

Hot weather losses have been practically eliminated on this poultry farm since Igel installed cooling systems on all of his poultry buildings.

Wind can be compensated for by turning this lever to adjust direction of spray. This permits full benefit from the water.

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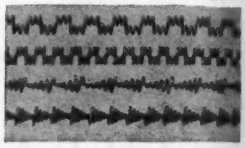

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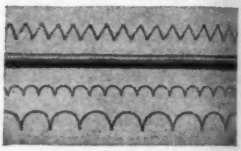

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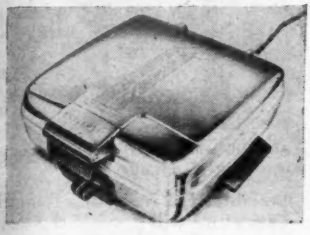
Let's Shop for

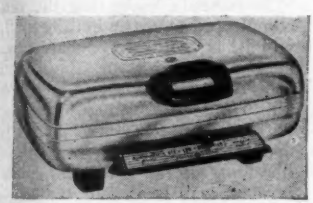
Grill and Waffle Bakers and Broilers

Ready for special duty to make cooking easier whether done in the kitchen, at the table, or in the yard are grill and waffle bakers and broilers.

If you want to grill, fry, toast, bake, or make waffles the grill and waffle baker is ready to serve you. A new feature of two models is reversible grids with a waffle form on one side and the grill on the other. There is no extra grid to store and it is changed merely by turning over. Other models have two sets of grids that are easily interchanged by clipping into place. All these grids are treated to prevent sticking. Grease them according to manufacturer's instructions. This appliance may be used as a waffle baker, an open grill or a closed grill. When used closed most of them have an expansion hinge to take care of thick sandwiches and chops. A spill-over rim on the waffle grid catches the excess batter to prevent its running over the outside. And a grease spout on grill drains excess fat when meat is grilled.



Universal



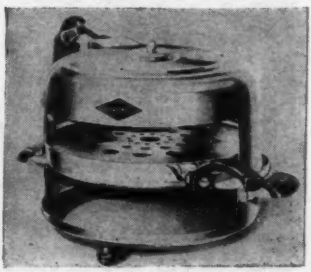
General Electric

Automatic thermostatic control has eliminated guess work and peeking to tell when waffles or toasted sandwiches are done. This control is set for the desired temperature and a light goes out to tell you when the temperature is reached and it is time to start cooking. This same light goes on when the waffle batter is poured in and then off when done.

These appliances using 1150 to 1320 watts are larger in size, automatic, versatile and convenient for parties and family meals. They are priced according to size and controls from about 18 to 33 dollars.

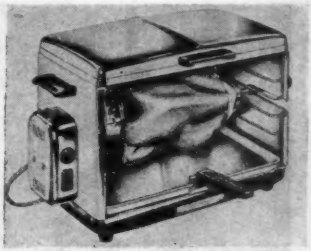
For producing delicious steaks or chops in the backyard without the fuss of starting a charcoal fire is the broiler. Its infrared heating unit imparts a charcoal flavor to the meat whether it is used outside or in the house. These appliances can be purchased for 40 to 80 dollars either as regular or barbecue broilers. The difference is that the barbecue broiler is equipped with a motor driven removable spit for barbecue cooking. By removing spit it becomes a regular broiler.

Heat units of these appliances vary from two heats to fully automatic controls. Some have low, medium, and high controls. Others have automatic controls that can be pre-set to go on and off up to 2 or 4 hours.

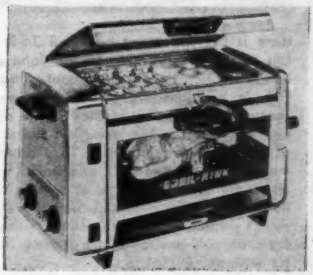


Everedy

This versatile meat cooker which grills, fries, broils, or roasts is usually rectangular in shape. There are a few round ones to resemble frying pans. In both of these, broiling levels vary to accommodate the various types of meat. Barbecue broiler units vary in size to hold a 10 to 15 pound fowl or a 10 to 20 pound roast. Extra attachments include a skewer for barbecuing canapes and small pieces, bacon rack, egg wells, corn popper, and baking tray.



Dormeyer



Broil-King

Both broiler and grill and waffle bakers are designed to make it easier for the homemaker to prepare a variety of foods both for family meals and for entertaining. These are two more of the many small appliances that have been designed to make cooking a pleasure.

XUM

Attic Fan "Comfortizes" Home

Against Summer Heat and Winter Stuffiness

Now is the time to make plans for providing home comfort from summertime heat. And one of the best bets, next to air conditioning, for supplying this overall comfort against intense daytime heat combined with calm breezeless nights is an attic fan installation. Properly installed it will create a breeze throughout every room of the house and at the same time exhaust stored up daytime heat.

Here is the attic vent box and 36-inch fan vertical installation in the Johnson home. Notice the fusetron control box. This is an auxiliary switch—the main control switch, being located in the den on floor below. The principal purpose of this fusetron installation is to protect motor from overload. In addition it will open the circuit in case of fire in the house. It also provides an auxiliary switch which will take away control from normal control switch during winter months.

Often summertime day heat may provide temperatures as high as 130°F. in an attic. Below this in a normally insulated upstairs room the temperature may be a sweltering 102°, while the downstairs room will be around 92°. In tests conducted by a commercial company, it was found that a fan cooling system in an attic can lower room temperatures as much as 27°. This type of an installation not only serves in the summer, but is an excellent way of removing smoke and stuffiness from the house in winter without chilling.

In planning for an attic fan installation, the first step is to select the right size fan. This is determined from cubic foot volume of the house and amount of air to be moved to properly cool and ventilate. The need of air movement varies from a change every minute in southern states to a change every three minutes in northern areas. The R. E. Johnsons installed an attic fan with a one minute change in their home last year. They have found this none too much on a warm day although the usual recommendation for their northwestern Ohio section is an air change every one and one half minutes.

Headroom in the attic often determines whether the fan should be vertically or horizontally mounted. The vertical mounting is installed in an airtight suction chamber, a vent box, or in a dormer on the roof. To eliminate the complications of building this box and for simpler installation a pancake or horizontal mounting is recommended. Also this type requires less headroom and is suitable for low attics. Having installed his fan in a vertical position, Bob Johnson recommends using a pancake mounting whenever possible. He feels this is much easier and will provide the same amount of comfort.

Required Ceiling Opening For Vertical Mounting

Propeller Size	Approximate Dimension Ceiling Opening (ins.)
24″	25x25
30″	31x31
36″	37x37
42″	37x49
48″	43x55

Air grill with shade screen is located in ceiling of upstairs hallway.

In pancake mounting the fan is mounted over the ceiling grill, which is centrally located in ceiling of top floor. The grill should be large enough to allow air to pass through quietly and with moderate velocity. It is usually about an inch larger than diameter of the fan. This same type of grill is also used with a vertically mounted fan. Check the accompanying chart as to size of opening. An automatic or motor driven shutter is placed below the grill to seal off attic from living area when the fan is not operating.

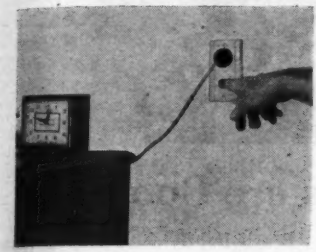
Automatic ceiling shutters open automatically with the fan operation. These serve as a cover to the grill and are installed on

Curtains show air movement created by attic fan, thus cooling entire house.

XUM

the face of it or flush with the ceiling. The shutter should be installed with a fusible link to close in case of fire.

Motor operated shutters permit fan to exhaust air at peak



The main control switch with time clock is installed in den.

efficiency without loss of capacity in having to pull open the shutters. A small torque motor operates the shutter louvres which open fully when fan is operating and close when fan is stopped. This motor usually is connected parallel with fan motor for instantaneous operation from a single switch.

It is important to have ample free area in the air outlet which expels the air to the outdoors. Usually it is one and a half times that of the opening in which the fan revolves in the pancake mounting. To prevent loss of efficiency this outlet should never be located on side of house facing prevailing winds. These openings, too, need louvres or shutters as a protection against weather unless the opening is in a sheltered location. Generally these louvres are metal as they are thinner and offer less obstruction to flow of air than wood. Any screening that is placed over the outside cuts down on the efficiency. To overcome this the outlet area should be increased.

As a general rule these fans are operated at night bringing in the cooler night air to provide better sleeping conditions and to set up a resistance to heat of the coming day. Theoretically, it is not desirable to operate them during hot period of the day. However, the Johnsons found they received some benefit from running it almost continuously during hot weather. While there was no cooling effect from the heat, they found it afforded comfort by providing a stir of air.

They would recommend an attic fan to anyone as an aid in overcoming excess heat in the house during summer months. Thus a house can be made more livable by having the cooler evening air circulated through it.

Awning type window is installed in attic to serve as air outlet.

Fan Exhaust Opening Size According to Protective Covering

(openings are in square feet)

Fan Size	22"	24"	30"	36"	42"	48"
Full Opening no screen or cloth.....	5.5	6	9	12	18	23
Full Opening with 16 mesh screen.....	11	12	18	26	36	46
Full Opening with ½" hardware cloth..	6.6	7.2	10.8	15.6	21	27
Wood Louvres no screen or cloth.....	8	9	13.5	19.5	27	34
Wood Louvres with ½" hardware cloth..	9.6	10.8	16.2	23.4	32	41
Wood Louvres with 16 mesh screen....	16	18	27	39	54	69
Metal Louvres no screen or cloth.....	7.2	7.8	11.7	16.9	23	30
Metal Louvres with ½" hardware cloth..	8.6	9.4	14	20.3	28	36
Metal Louvres with 16 mesh screen....	14	16	24	33	47	60

Strawberries for Freezing

Strawberries are here again—red, ripe and ready for freezing. By freezing them in a variety of ways they become a treat at any time of the year. Whether frozen whole, sliced, or crushed as a puree, as sparkling red juice or in jam or jell they have a mouth watering effect.

Slightly tart, firm, ripe, top quality berries should be selected for freezing. To prepare them, sort, wash in cold water, drain well, and hull.

Whole berries are better sugar or syrup packed. However, these have a tendency to become soft during thawing. Medium sized berries seem to hold up the best for this way of freezing.

One cup of sugar is used for each 1¾ cups of water for the syrup. Dissolve the sugar in boiling water and chill. One half to three fourths cup of syrup is used for each pint of berries. Place fruit in the freezer container and cover with the chilled syrup. Crumple foil or freezer paper and place on top of the fruit to keep it under the syrup. Head space should be allowed in all containers—¾ inch for pints, 1 inch for wide mouth quart containers, and 1½ inches in each quart mason jar. Seal and freeze.

For sugar pack use 1 cup sugar to each 4 to 6 cups berries.

Sliced or crushed berries are usually packed in sugar. Use same proportions as for whole berries. Mix the sugar through the berries. This will draw out some of the juice. Pack, leaving head space.

Strawberry puree is made by pressing strawberries through a sieve. Mix well with sugar 1 cup to 1½ quarts puree. Pack and freeze.

Strawberry juice makes use of berries that are too small or soft for freezing by other methods. Fully ripe berries produce the most juice. Crush the berries and put them through a cheesecloth or jelly bag to extract the juice. This may be sweetened to taste or left unsweetened according to the intended use.

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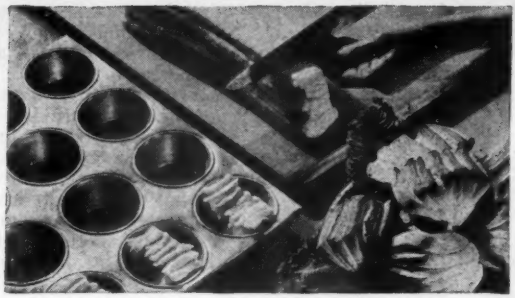

Yeast Rolls are Good

Nothing smells quite as tempting as rolls fresh from the oven. And they not only smell good but are tasty when served warm from the oven. Yeast rolls are easy to make and are one type of baked goods that you do not have to worry about over beating or handling too much.

Here are two recipes for you to try. Serve your family warm yeast rolls as a special treat.

FAN TANS

- ¾ cup milk
- ¼ cup sugar
- 2¼ teaspoons salt
- 4½ tablespoons shortening
- ¾ cup lukewarm water
- 1 package active dry yeast or 1 cake yeast
- 4½ cups sifted all-purpose flour

Scald milk, add sugar, salt, and shortening. Stir until dissolved. Cool to lukewarm. Put lukewarm water into a large mixing bowl. Sprinkle or crumble in yeast. Let stand until dissolved, about 10 minutes. Add lukewarm milk mixture. Stir in 2¼ cups of flour. Beat until smooth. Add remaining 2¼ cups flour and mix until dough forms an irregular ball and comes away from sides of bowl. Turn out on lightly floured board and knead until dough is tightly stretched, does not stick to board. Place in greased bowl and brush top lightly with melted shortening. Cover with a towel.

Let rise in a warm place, free from draft, until doubled, about 1 hour and 25 minutes. Punch down with fist, pull sides into center and form into a ball. Divide into two parts. Roll out each part into an oblong about 17 x 10½ inches and ⅜ inch thick. Brush lightly with melted margarine or butter. Cut with a sharp knife into crosswise strips 1½ inches wide and pile 7 strips together. Cut crosswise into pieces 1½ inches wide. Place cut-side up in greased muffin pans and cover with a towel. Let rise in a warm place, free from draft, until doubled, about 1 hour. Bake in a moderate oven, 400°, about 20 minutes. Makes about 18 rolls.

SWEDISH 1-2-3 ROLLS

- ½ cup milk
- ¾ cup honey
- 1¼ teaspoon salt
- 6 tablespoons shortening
- ½ cup warm, not hot water (lukewarm for compressed yeast)
- 2 packages or cakes yeast, active (dry or compressed)
- 3 eggs, beaten
- 1 grated orange peel
- 6 cups sifted enriched flour

Scald milk. Stir in honey, salt, and shortening. Cool to lukewarm. Measure water into a large mixing bowl (warm, not hot, water for active dry yeast; lukewarm water for compressed yeast). Sprinkle or crumble in yeast. Stir until dissolved. Add lukewarm milk mixture, eggs, orange peel, and 3 cups flour. Beat until smooth. Stir in re-

maining flour, or enough to make a dough. Turn out on lightly floured board and knead 8 to 10 minutes or until dough is smooth and satiny and does not stick to the board. Put dough into greased bowl and brush top with melted shortening. Cover with a cloth.

Let rise in a warm place, free from draft, until doubled in bulk, about 55 minutes. Punch down dough, pull sides into center and turn out on board. Roll small pieces of dough with palms to form ropes ¾" thick and from 4" to 6" long. Shape on greased cooky sheets into 1-, 2-, or 3-wheeler rolls. For a 1-wheeler roll, use a 4" rope. Wind into a spiral ending in a center point. For a 2-wheeler roll, use a 5" rope. Shape each end into a spiral. For a 3-wheeler roll, use a 6" rope. Shape each end into a spiral forming a round loop between them. Brush rolls with beaten egg. Sprinkle with sugar and garnish with chopped currants. Cover and let rise until doubled in bulk. Bake at 425° F. 5 to 8 minutes.

Freezing Asparagus for Year Around Use

Freezing has provided us with year round enjoyment of many delicious vegetables. Asparagus is one of these treats that has a short growing period. Ordinarily this would mean that it would appear on our tables only a few times. Thanks to the freezer it serves as a pick-up for many meals. And still another asset is that it is easy to freeze.

Select tender, young stalks with compact tips and sort according to size-thickness of stalk. Wash and cut or break off tough ends. The tips may be left in lengths to fit the carton or cut in 1 inch pieces.

To retain color, flavor, texture, and nutritive value asparagus must be blanched. Blanch one pound of asparagus in 6 quarts of boiling water for three minutes. Count the time from moment asparagus is placed in boiling water. Cool at once in cold running water or ice water and drain. Place in freezer cartons, seal, and freeze. In packing the whole spears, space can be saved by alternating tip and stem ends.

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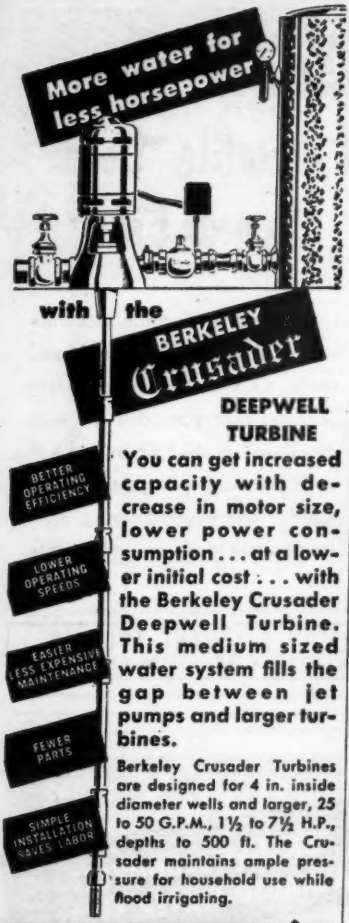

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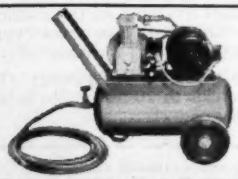

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Watch Weight of Laundry

Are you baffled by instruction books which caution you to launder a six-pound load for best results? Unless you use a scale, you don't wash and dry clothes by the pound, but you do need some simple rules of thumb like these to guide you in sizing up a load:

1. Do not dry more than two large items—double sheets, long tablescloths—in one dryer load. Complete with smaller items.

2. Three yards of average weight cotton material will weigh one pound. Two yards of heavier cotton fabric, such as turkish towelling or corduroy, will weigh a pound or more. A six-pound load washes cleaner than a larger load, according to studies at the U.S.D.A. Bureau of Human Nutrition and Home Economics. Six pounds add up fast!

Sort clothes, using only six pounds per load for best laundering results.

3. Percale sheets weigh ¼ pound to ½ pound less per sheet than muslin, depending on size. (They dry quickly and fairly wrinkle-free in the dryer and add the comfort touch to a bed with their cool smoothness.)

Some approximate dry weights:

1 double sheet (muslin)	2 pounds
1 single sheet (muslin)	1½ pounds
3 to 4 pillow cases (muslin)	1 pound
2 turkish bath towels, av. wt.	1 pound
4 to 5 turkish hand towels	1 pound
15 turkish wash cloths	1 pound
5 to 6 dish towels	1 pound
12 linen napkins	¾ pound
3 dresses—percale or chambray	1 pound
2 men's shirts (broadcloth)	1 pound

Fashion Duo

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Send THIRTY-FIVE CENTS (in coins) for EACH pattern to: ELECTRICITY ON THE FARM, 233, Pattern Department, 243 West 17th Street, New York 11, New York. Add FIVE CENTS for EACH pattern for 1st-class mailing.

IN CANADA: 60 Front Street, Toronto, Ontario.

Frozen Fruit Spreads

As a result of research conducted at Washington State College and Colorado A&M, sauce, preserves, and jams can now be made without cooking. And better yet they retain all the flavor and aroma of fresh fruit.

Fruits tested for the easy-to-make frozen fruit spread were strawberries, raspberries, blackberries, blueberries, and cranberries. An uncooked applesauce was also developed.

Frozen Fruit Spread
Makes 1 pint

1 cup pureed fruit
4 tablespoons jam or jelly pectin
2 tablespoons granulated sugar
1 cup granulated sugar
2 teaspoons lemon juice

Puree the fruit. Use a food mill, if you have one. (Cranberries are better chopped than pureed.) Combine pectin and 2 tablespoons sugar and mix thoroughly. Add puree and mix well for 7 minutes, using low speed on electric mixer. Add one cup sugar and lemon juice. Mix for 3 minutes longer. Pour into freezer cartons and cover. Let stand at room temperature until jelled, about 20 to 24 hours. Freeze at 0°F or lower. To use, thaw at room temperature. Keep in refrigerator when not in use. If you want a less firm gel, use 1 tablespoon less of pectin.

Frozen Apple Sauce

2 teaspoons sodium bisulphite (available at drug stores)
2½ teaspoons salt
2½ gallons water
20-25 pounds of apples to make 10 pounds frozen pulp
2 teaspoons ascorbic acid
1 pound sugar

Prepare dip by adding sodium bisulphite and salt to 2½ gallons water. This is sufficient to dip 20 to 25 pound apples.

Core and peel apples. Cut larger apples into 12 slices, smaller into 8. Dip slices into prepared solution for 2 minutes. Drain and freeze. Stir 2 teaspoons ascorbic acid into the pound of sugar. This is enough for 10 pound frozen pulp.

Grind the frozen slices in a meat grinder and immediately add sugar and ascorbic acid mixture. Stir and let stand only until sugar is dissolved. Package and freeze. Thaw and serve uncooked.

Found Facts

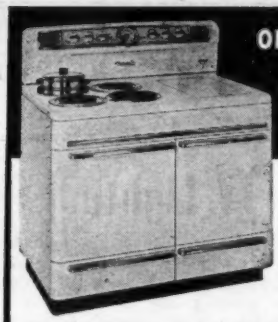
Slightly rusted sewing needles tend to stick when used; correct this by pressing the needle into a cake of soap.

For that tasty brown on pies and tart crusts, brush them lightly with milk before popping them into the oven.

Darkened bulbs and fluorescent tubes usually mean one thing; they're deteriorating and need to be replaced.

When you change the bedding, freshen the mattress and springs by going over them with vacuum cleaner attachments. Finish up by going over comforters and spreads.

Add left-over sausage meat to plain pancake batter or combine with left-over mashed potatoes; form into patties and brown in a sizzling frying pan.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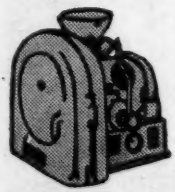

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TV Lighting Demonstration

By R. T. SCOTT

If you have a television set or are getting one in the near future here is a suggestion for a demonstration on "Television Lighting."

In this demonstration you can show four things: (1) the effect of watching TV in a dark room, (2) how light can be reflected from a TV screen, (3) the most satisfactory type of lamp shades to use in the room with a TV set, and (4) proper location of lamps for TV watching.

You can make an imitation TV set to use in your demonstration. Use a cardboard carton about 15 inches square and about 10 inches deep. On one side of the box fasten a framed glossy picture that is smaller than the side of the box. If you care to go a step further to make the "TV set" more realistic-looking, paint or crayon a set of knobs under the picture.

Additional materials you will need are:

An extension cord with a socket on one end
A 100-watt bulb
2 shades about 9 inches across the bottom. One opaque (does not permit light to pass). One translucent (permits light to pass through)
A piece of broomstick about 2 feet long covered with aluminum foil
A folding chair (optional)

A word about your demonstration. First practice demonstrating—showing and doing. Then after you have your actions planned and practiced you can decide how much talking you need to do. Your talk can explain what you are doing, why you are doing it, or how you are doing something—if it is necessary. Your talk can be different every time you give the demonstration. Doing and showing is the most important part of your demonstration.

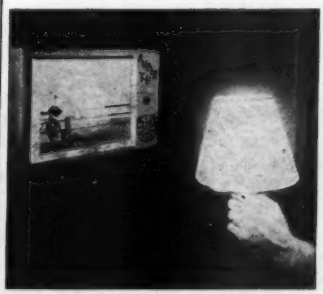
Your Introduction

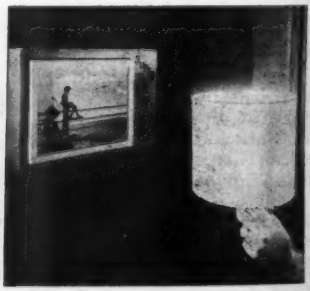
Wait until you work up the showing part of your demonstration—then develop your introduction. More on this later.

Here are some of the ideas you can demonstrate.

Television in a Dark Room

Television *should not* be watched in a dark room. The TV screen is much brighter than





Left: A translucent shade lets light through the shade. The picture is "faded" by this light and a TV viewer gets an uncomfortable glare from the screen. **Right:** An opaque shade does not let light through the shade. However, an opaque shade located too close to the front of the TV set can also cause some picture "fading" and uncomfortable glare. A better location would be to one side of the set in a position where light does not fall on the screen.

Moving the lamp to the side so that light does not fall on the screen keeps the TV picture clear. However, the translucent material permits too much light to come through the shade and may cause TV watchers to be uncomfortable.

a movie screen—about 10 times brighter.

If you watch TV in a dark room your eyes must continually adjust to the contrast between the bright screen and the dark room. The pupil of the eye opens up to let in more light if your eye is looking at something dark; the pupil closes up—lets in less light—when the eye looks at something bright.

You can demonstrate to the audience how the eye muscles get over-worked and tired. Ask the people to put one hand up in the air. Then ask them to open and shut that hand for ten seconds. You can count to yourself slowly—one, one hundred; two, one hundred; etc. up to ten. The muscles in the hand get tired. That is what happens to the eye muscles if the eyes must continually adjust themselves to a bright TV screen in a darkened room. You get sleepy, or at least, you get eye-tired. That is why you need good lighting for watching TV.

Reflections From TV Screen

Use the bare bulb in the extension cord socket to show how light can be reflected from the TV screen. If you have a chair available you can place the chair to one side in front of the cardboard box "TV set". Then hold the light in front of the set at the opposite side. The light will be reflected from the TV screen to the seat. This would be in the viewer's eyes if he were sitting in this chair. Also, the picture will "fade" and will not be sharp and clear. Put the opaque shade over the light and show how a highly polished standard or stem on a floor lamp or table lamp might also reflect light into the screen. Use the piece of broomstick covered with aluminum foil as a substitute for the standard or stem of the lamp. Hold the foil-covered broomstick in such a position that it reflects in the screen. (You may have to move this across in front of the picture so that all of the audience will see the reflection.)

Light may be reflected from ceiling fixtures. This can be shown by holding the light without a shade above and in front of your TV set—light will be reflected from the TV screen.

If light is reflected from the screen into viewers' eyes it produces uncomfortable TV watching. The seating may be rearranged or lamps may be rearranged. You must also check lamp shades to be sure they are

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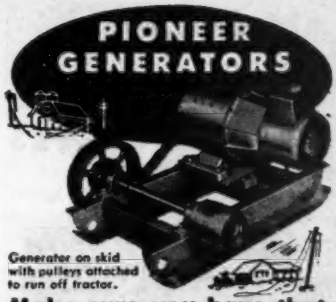

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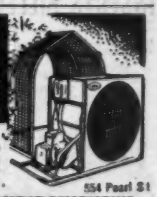

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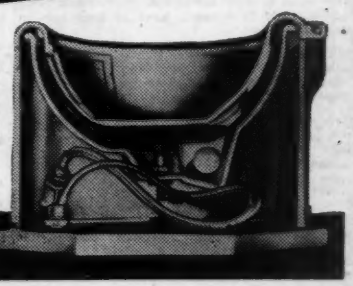

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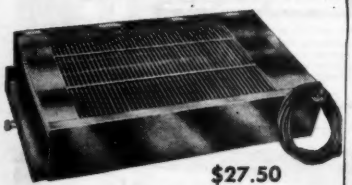

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not too bright—let too much light through.

Types of Lamp Shades

Not all lamp shades are good lamp shades to use in the room where you watch TV. With your two lamp shades—one translucent (permits light to pass through) and one opaque (does not permit light rays to come through)—you can show the best lamp shades to use.

Using the extension cord, your 100-watt bulb, and the translucent shade show how light comes through the shade. You can also show how this might be reflected from the screen on your TV set.

Then clip the opaque shade over the bulb. With the opaque shade you can show the audience that no light comes through the shade to reflect from the screen.

A tip: Turn the 100-watt bulb off when you change shades. The bare lighted bulb will distract the audience, bother their eyes, and make your demonstration less effective.

Location of Lamps

The first idea you demonstrated was how the eye got tired watching TV in a dark room. One good location for a lamp is on top of the TV set or behind it. You can hold the bulb with the opaque shade over the set to show the effect of this type of lighting.

You can also show how this lamp should not be so low that people walking around the room look down into it. Hold the lamp down below your face and explain to the audience that you cannot see them with the light hitting you in the face. Also show that it would be just as bad if the lamp were too high—high enough for people to see under the shade while they were watching TV.

Another lamp location problem you can demonstrate is the lamp located close enough to the set with the shade high enough to permit light to escape under shade and hit screen.

Your Conclusion

Review your main points. Stress the importance of watching TV in a well-lighted room.

The Introduction

Develop your introduction last. Make it interesting. Make the people want to see *this* demonstration.

You might find out how many TV sets there are in your town, or how many have been sold in the last year. If you do not have television yet, you might want to find out when TV is coming to your town and give this as the reason why your demonstration is useful information. You may want to tell the audience how you improved the TV lighting in your home and how much more enjoyable it is to watch TV now.

Whatever you use in your introduction—make it interesting and brief—then demonstrate.

4-H Electric Program Nationwide

Forty-eight states have accepted the 1955 4-H Electric Awards Program, according to an announcement by the National Committee on Boys and Girls Club Work in Chicago. Club members in all states will have an opportunity to participate in the Awards Program with county, state and national awards provided by the Westinghouse Educational Foundation.

To recognize outstanding achievements by Club members, four gold medals are offered in each county, all-expense trips to the National 4-H Club Congress in Chicago are available for state winners, and six $300 college scholarships are available for national winners.

In order to qualify for a state trip to Club Congress each state

"She's discontented again! Now she wants television!"

must submit names of county winners from 15% of the counties in the state or 15 counties, whichever the State 4-H office chooses. If the specified number of counties do not name winners the state is only eligible for county awards.

State winners must have passed their 14th birthday and must not have passed their 21st birthday by January 1, 1955. State winners must also have completed three years of Club work.

State winner records must be in the offices of the National Committee on Boys and Girls Club Work by October 25, 1955. Deadlines for records going to the State 4-H offices are determined by the State 4-H Club staff, and deadlines for submitting records to county offices are determined by County Extension Agents.

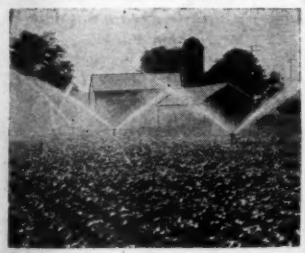
Specific project requirements for each state are available from State 4-H Club offices as well as dates when record books are due in State offices.

Water Conservation

. . . . . (Here from page 7)

later you will probably wish it were even larger.

Too much cannot be said for cover crops, grass, and terrace



Irrigation, even in humid areas, is becoming a major farm use of water. Strict conservation is only hope for a continued available water supply.

farming. These not only hold precipitation and moisture for current production, but assist greatly in replenishing ground water resources by retarding run-off.

Reforestation is a long range project so far as cash income is concerned, but results in retaining water and soil are almost immediate. The final income in cash or increased land values fully compensates for the effort. Many farms have acreage available for tree planting that would otherwise be of little productive value.

Citizens generally are and will continue to cooperate more seriously not only in water conservation, but by assisting in every way possible to encourage full community action. They will learn many things through such cooperation, especially in respect to the rights and needs of the farm areas. In addition to what you can do on your own farm and through the indicated organizations, you can urge and persuade your local banks, your dealers, the service clubs, Chambers of Commerce, town officials, and others, to become interested and work with these groups.

The situation is most intriguing. The fact that by doing a really constructive job of conserving and utilizing our water resources now, we can continue to have the most prosperous and productive country in the world for generations to come.

Let the children be partners in planning the family decisions.

to install a new water pump or replace your old one?

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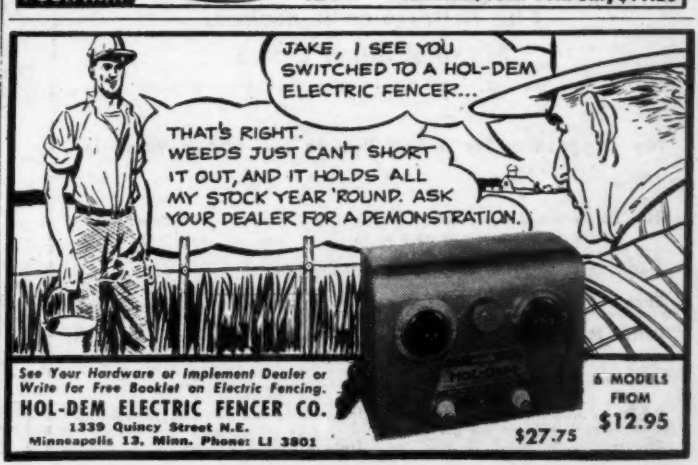
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The first prize will be $25 cash; the second prize $10. In addition, five consolation prizes of $3 each will be awarded for the best last line furnished.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

All members of the farm family to whom this magazine was sent may enter but each contestant may submit only one line.

Question "A" must be answered.

Entries must be sent to the Contest Editor, ELECTRICITY ON THE FARM Magazine, 8 So. Dearborn Street, Chicago 3, Ill., before June 8.

The decision of the judges is final and all entries become the property of ELECTRICITY ON THE FARM Magazine.

Winning names and entries will be announced in the October issue.

Send your entry on the coupon or make out a similar form on a plain sheet of paper or government postcard.

My mixer saves me lots of time
What's more, my cakes are all sublime
The difference it makes!
My arm never aches
? ? ? ? ? ? ? ?

My suggestion for a last line to the above verse is:

.....

[A] Fill in brand name for each of the Electric Home Appliances listed below that your family now owns.

Clothes Washer..... **Dishwasher**.....

Clothes Dryer..... **Ironing Machine**.....

Coffee Maker..... **Water Heater**.....

My name is.....

R.F.D...... **Post Office**.....

County..... **State**.....

Awards for February Contest

When winter winds whistle and roar
To hang clothes outside is a chore
No maid I might hire
Could compete with our dryer
? ? ? ? ? ? ?

The Winning Last Lines

FIRST PRIZE—$25 CASH

"Watts banished a task I abhor"
Margaret Alice Wenzel
Prairie du Sac, Wisc.

SECOND PRIZE—$10 CASH

"A convenience wise folks won't ignore"
Mrs. Elizabeth Bland
Baraboo, Wisconsin

Five Consolation Prizes—$3 Each

"Its performance deserves an encore"
Mrs. Harry Koziar
R.F.D. 1
Pitman, Pennsylvania

"Making washday a dream not a bore"
Mrs. Lillian Bruden
Summit Lake, Wisconsin

"For watts soon taught me the score"
Mrs. Keith Jordan
Claflin, Kansas

"The task of line hanging's now o'er"
Mrs. W. P. Millner
Amherst, Virginia

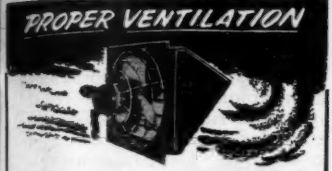
"In beating the weather's rough score"
Mrs. William Lloyd Beck
R.F.D. 2
Princeton, Kentucky

Honorable Mention

Paul H. Balding, Staunton, Illinois; Mrs. Ruth Bouldin, Independence, Missouri; Mrs. Mae Bradbury, Hastings, Florida; Mrs. Carl Brannstrom, Ensign, Michigan; Ralph Fitch, Norwich, Connecticut; Mrs. W. C. Geyer, Sumner, Iowa; Esther Sue Gingerich, Chardon, Ohio; Lester G. Gunderson, Northfield, Minnesota; Mrs. David Kornowski, Emmett, Kansas; Marsha Lamb, Blair, Nebraska; Mrs. Emma Qualmann, Iron Ridge, Wisconsin; W. J. Rodman, Rae Heights, South Dakota; Mrs. Paul Roller, Timberville, Virginia; Mrs. Edwin W. Tipple, Ghent, New York; Mrs. Joy Wilson, Almont, Michigan.

The verse for this month's Rhyme Contest was furnished by one of our readers, Mrs. Franklin Wrolstad, Route 1, Amherst, Wisc.

PROPER VENTILATION



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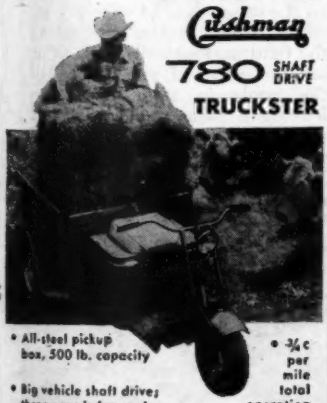

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• ¾c per mile total operating cost

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Questions and Answers

Underground Hot Water Pipe

▶**Question:** *Would like some information about running a hot water pipe underground. I want to run a hot water line to laundry room, a distance of 35 feet from the house, putting it 6 feet deep. Now, am wondering about the problem of heat loss. Is there some way I can prevent this by insulating or using double pipe?*

C. K., Wisconsin

▶**Answer:** Your best bet is to run the hot water line inside of fiber conduit, pipe, or watertight tile. Center it in the pipe with spacers. Keep the hot water line dry and away from soil. You will get hot water quicker at the laundry through thin-wall copper tubing than through heavier pipe. Insulation at the depth will do little good unless you are going to use the water quite continuously at the laundry.

An alternative is to install a water heater in the laundry and save the pipe losses. The cost of the water heater would be partly offset by the saving on ditching, piping, and insulation.

Testing Water

▶**Question:** *Can you tell us how to determine whether or not our drinking water is safe? Our water is slightly muddy when it is pumped from the well.*

A. C. D., Indiana

▶**Answer:** The only way to find out if the water from your well is safe is to have it tested. This can usually be accomplished through the State Board of Health. If you will write to them, they will provide you with information as to how to take a sample and where to ship it so that it can be properly analyzed.

From the description of your water source, the well probably needs a good cleaning. This can be done by bailing it out and flushing it thoroughly. It

NEW Low-Cost SAFGARD MILK and CREAM PASTEURIZER

THE 5 QUART PRES-VAC MODEL P-5000

Only $27.95

This smaller, lower-priced SAFGARD Pasteurizer has the same bacteria-killing *pressurized heating* and flavor-saving *vacuum-sealed cooling* as the big 8 quart SAFGARD Model P-3000. It is the only low-cost pasteurizer with *all-over water bath* to assure fast, complete heating without scorching the milk. The SAFGARD PRES-VAC destroys all harmful bacteria in 15 minutes — ¼th the usual time. Ask your dealer for the SAFGARD Pasteurizer. For FREE descriptive circular write Dept. 5-E

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GRAND SHEET METAL PRODUCTS CO.
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MODERNIZE AT LOW COST

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Fig. 3130 Illus.

Figure 3130 ½ HP. Cap. to 1050 GPH. **Figure 3130** 1/3 HP. Capacity to 815 GHP. Complete with 6-gal tank... only $89.50 (f.o.b. Dubuque)

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and
DEEP WELLS

A single water system that takes care of today's needs and looks to the future! That's Dempster Convert-o-Jet, the quickly convertible pump which can be changed from shallow to deep well operation in a matter of minutes and at no extra cost. Available in ⅓ HP or ½ HP models — for capacities up to 720 gals. per hour and depths to 90 ft. At one low cost everything for deep and shallow well operation, except the pipe, is included.

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Town_____ State_____

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NAME.....

Post Office.....

R.F.D.....State.....

should also be treated with chlorine to establish a sanitary well. Information on this can also be obtained from the State Board of Health.

Adding Extra Yard Light

▶**Question:** *I have a light at the house, about 150 feet from the barn. There is a three-way switch at the house and one at the barn controlling this light. The switches are connected by three wires buried underground. The power supply is from the house. Is there any way that I could add a light on this same circuit at the barn without adding a fourth wire?*

R. N., Wisconsin

▶**Answer:** It is not possible to add a light at the barn on this same circuit without adding a fourth wire between house and barn. Any combination that could be worked out with only three wires would put lights in series. Such a set-up would not give satisfactory service, nor would it conform with the regulations of the National Electrical Code which must always be followed for any wiring.

The Meaning of "R-30"

▶**Question:** *Would you please explain the meaning of the "R-30" designation used on the 75 watt flood lamps described on page 4 of your February issue? Does R-30 mean the lamps have a different power than just for lighting?*

C. L., Montana

▶**Answer:** The "R-30" is an industrial designation used on these flood lamps. The R means that the lamp has a built in reflector. Face diameters of bulbs are designated in eighths of an inch. This particular lamp has a face diameter of 30/8ths, or 3¾ inches.

Grounding Water Heaters

▶**Question:** *During the summer months, many water heaters are damaged by lightning. Is there any way to ground the water heaters or the wiring to prevent this lightning damage to the heating elements?*

R. L. B., Michigan

▶**Answer:** The main problem involved in the grounding of water heaters is the fact that they are not always grounded to the main service ground. The water system in itself provides some grounding. The electrical system in rural areas is usually grounded by means of a driven ground rod. The two grounds—the rod and the water system—each offer a different potential to ground. If the two are not bonded together, the high currents resulting from lightning are carried from one ground to the other through the water heater or some other appliance, thus damaging the appliance.

The above situation can usually be remedied by tying all grounds together with a conductor of low resistance.

Underground Wire

▶**Question:** *I have the problem of connecting an electric fence on one side of a road to a similar fence on the other side. I have thought of making the connection by means of a buried cable. Would this be practical, and if so, what size wire?*

J. S. W., Alabama

▶**Answer:** Type UF cable has been designed and is acceptable for direct earth burial. As such, it would be entirely satisfactory for connecting your fence on one side of the road to the fence on the other. No. 14 wire will be ample to handle the current. As the road undoubtedly gets a fair amount of travel, you should lay the cable in stone-free sand, leaving a little slack in it and placing a board over it before refilling the ditch.

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Patent Applied for.

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Be sure to see this most advanced of all refrigerator-freezers* . . . because *only* Hotpoint offers you *3-way* automatic cold plus all modern convenience features.

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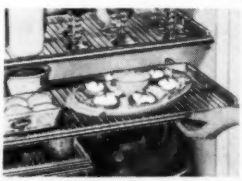

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